REMARKS

Claims 1-4, 6-15, 17-41 and 43-48 are pending.

Claims 14-15 and 19-41 have been withdrawn in view of a restriction requirement.

I. Claim Amendments

Claims 6, 7 and 44 are amended to recite "weight average". It is respectfully submitted this does not present new matter for reasons explained in the concurrently filed Rule 132 Declaration by Vance Bergeron. It is respectfully submitted this does not present a new issue because the Final Office action already interpreted Claim 7 and the Fink et al. reference as disclosing weight average ranges for purposes of making a rejection.

II. 35 USC 112, second paragraph

Claims 1-4, 6-13, 17, 18 and 43-48 are rejected under 35 USC 112 as being indefinite. The Office action interprets the recitation of a "molecular weight of the polymer is in the range of about 10,000 to about 300,000 daltons" in claim 7 as being an average weight range, but asserts it is unclear if it is a weight average molecular weight range or a number average molecular weight range.

As explained in the concurrently filed Rule 132 Declaration by Vance Bergeron, Claim 7 recites a weight average molecular weight range.

III. 35 USC 102/103 Rejection in View of Fink et al.

Claims 1-13, 16-18 and 43 are rejected under 35 USC §102 as being anticipated, or in the alternative under 35 USC 103 as being unpatentable, in view of Fink et al. (US 4,542,175).

In view of a species election, Applicants' elected the species of claims 1-13 and 16-18 and 43, exemplified in Example 1 of the specification (page 139). This species is a poly(HEA-co-DMAM-co-AA) terpolymer. HEA is 2-hydroxyethyl acrylate; DMAM is 2-(dimethylamino)ethyl methacrylate; and AA is acrylic acid.

The Office action again asserts Fink et al. (col. 5, line 3 to col. 6, line 42) disclose terpolymers comprising DMAM, HEA and AA. This rejection is respectfully traversed.

A. The Present Claims are Outside the Molecular Weight of Fink et al.

Claim 7, as currently amended, and all of the other claims that are dependent thereon, now

recite the polymer has a weight average molecular weight of about 10,000 to about 300,000 daltons or a narrower range. In contrast, the Fink et al., Abstract and col. 2, lines 44-45, states its synthetic polymer has a molecular weight of at least 500,000.

The Office action asserts "both Fink et al. (abstract) and the molecular weight as claimed are silent [on] the type of molecular weight being disclosed or claimed. Since Fink et al. (abstract) disclose a molecular weight of at least 500,000 which can be a weight average molecular weight, and that a weight average molecular weight of a polymer is generally higher than the number average of the same polymer having a molecular weight distribution that is skewed toward [a] high molecular weight portion of the molecular weight distribution of the polymer, the examiner has a reasonable basis [for assuming] that the molecular weight properties as claimed is inherently possessed." These assertions are respectfully traversed.

As explained in the concurrently filed Rule 132 Declaration by Vance Bergeron, the present application claims, e.g. Claim 7, recite ranges in weight average molecular weight and the polymers described in US 4,542,175 to Fink et al. are in weight average molecular weight. Thus, the presently claimed ranges and the range of US 4,542,175 to Fink et al. do not overlap.

Moreover, a weight average molecular weight is generally higher than a number average molecular weight. Thus, if the range of US 4,542,175 to Fink et al. was a number average molecular weight range then the corresponding weight average molecular weight range would be higher and further removed from the presently claimed weight average molecular weight ranges. Thus, since the molecular weight ranges of the present application claims are weight average, Fink is avoided regardless of whether it is number or weight average.

Thus, the rejection of claims 1-4, 6-13, 16-18 and 43 as anticipated by or in the alternative as obvious over Fink et al. should be withdrawn.

B. Molecular Weight Recited By Dependent Claims

Claim 6 recites a weight average molecular weight of about 10,000 to about 100,000 daltons. Claim 43 recites a weight average molecular weight of about 35,000 to about 300,000 daltons.

In contrast, the Fink et al., Abstract and col. 2, lines 44-45, state its synthetic polymer has a molecular weight of at least 500,000. Thus, Fink et al. teaches away from all of the claims as currently amended.

C. Fink et al. Does Not Select the Present Polymer

Moreover, Fink et al., col. 5, lines 27-30, mentions dimethylaminoethyl methacrylate as one of a number of a large number of monomer component (A) of its synthetic polymers, which include the esters of alpha and beta unsaturated polymerizable monocarboxylic or dicarboxylic acids having at least one basic nitrogen atom in the alcohol portion that are disclosed as the preferred component A in view of their thickening properties (see Col. 5 lines 3-64), but as Applicants previously pointed out, Fink et al. disclosed:

> "Those esters which contain an ethylene group as R1 give dispersions which have a tendency to thicken even above a pH of 7 and, to be sure, tend all the more to thicken the smaller the total alcohol portion of the ester is. For this reason, dispersions of polymers containing dimethylaminoethyl methacrylate are not among the preferred embodiments of the invention."

Thus, Fink et al. does not recommend the selection of DMAM, from the large group of its monomer component A to be used in the reaction with the weakly water soluble monomers of the disclosed monomers (B) or the readily water soluble monomers (C) which are individually or both reacted with the Component (A) monomers to increase the hydrophilicity of the resulting emulsion polymer (see Col. 6, lines 42).

Applicants respectfully assert the Office action's selection of DMAM from Fink's list of components (A), which was clearly not of the preferred group of monomers in Fink et al. with HEA and AA is solely motivated by the impermissible use of hindsight and does not anticipate or make obvious the specific copolymers and terpolymers of Applicants' invention.

As shown in Example 1, for instance, when 9 mmoles of HEA (25.0 gr.) are reacted with 3mmoles of DMAM (11.28 gr.) and 1mmole of AA (1.72 gr.), the resulting polymer would contain more than 70% by weight of the HEA and AA components. This is significantly above any level of use of these components in Fink et al. even if one skilled in the art should be motivated to select these individual members of the monomers disclosed in Fink et al.

Also, Fink et al. fails to even disclose whether it tested a homopolymer or a copolymer of DMAM. Thus, it does not direct one skilled in the art to select DMAM as a homopolymer or a

copolymer. Moreover, even if it did suggest using DMAM, there is no teaching to combine this non-preferred moiety with HEA, which is taught to be disadvantageous in many cases, and acrylic acid which is taught to be disadvantageous in many cases, to arrive at the DMAM-HEA-AA copolymer species elected for examination from the present invention.

IV. Dependent Claims 10 and 13 and New Claims 45- 48 Further Distinguish Over Fink et al.

A. Molar Ratios

Fink et al. mentions hydroxyethyl acrylate (HEA) and acrylic acid (AA) as common water soluble members of his component group (C). However, Fink et al. teaches the use of the water soluble monomer components (C), which include the monomers HEA and AA specifically required in Applicants' claimed species of copolymers and terpolymers, should "not amount to more than 30 percent by weight of the synthetic polymer" (See Col. 6, lines 20-24).

This contrasts with Applicants' Examples 1-3 and 5, which show the DMAM-HEA copolymer and DMAM-HPA-AA and PEG-DMAM-AA terpolymers having molar ratios of monomer unit A (DMAM) to Monomer unit B (HEA), (HPA) or (PEG) and monomer unit C (AA) preferred by Applicants to give the required charge density of no more than 2.77 units per 100 daltons. These examples, which are within the scope of the molar ratios of monomer units A to monomer units B to monomer units C in claims 10, 13 and new claims 45-46 and which are specifically claimed in new claims 47 and 48, use more than 30% by weight of the HEA and optional AA component C to arrive at the claimed copolymers and terpolymers of Applicants' elected species. Fink et al. do not disclose or suggest the use of HEA, HPA, PEG and/or AA in the molar rations claimed in current claims 10, 13, and new claims 45-48, wherein more than 30% by weight of the HEA and AA would be used to prepare the recited co-polymers and terpolymers.

B. Cationic Charge Density

Fink et al. does not teach to obtain the selected charge densities of present Claims 1 and 2. Claim 1 recites an average cationic charge density of 2.77 or less units per 100 daltons molecular weight at a pH of from about 4 to about 12. Claim 2 recites an average cationic charge density from about 0.01 to about 2.75 units per 100 daltons molecular weight at a pH of from about 4 to about 12. As disclosed in Applicants' specification, the cationic charge relates to the molar ration of the monomer units A, B and optional unit C used in the synthesis of the copolymers and

terpolymers.

Paragraph 5 of the previously filed Rule 132 Declaration (by an apparent typographical error it is entitled a "Rule 123 Declaration") explains the present invention co- and terpolymers contrast with the compounds of Fink et al. The charge density of the present amine based polymers is critical for suds stabilization via favorable polymer interactions with soils, thus preventing soil antifoam effects. As wash pH varies so can the cationic charge density which can cause negative interactions with any anionic surfactant that is present, leading to a loss of suds. To reduce the cationic charge and pH dependence of the soil/polymer interaction for the polymer, several alternative mechanisms, together with cationic charge, to increase polymer/soil interactions may be used. They are: 1) lower the overall charge density to minimize cationic charge and pH dependence on the polymer/soil interaction via the introduction of non-charged co-monomers with dimethylaminoethyl methacrylate, and 2) increase hydrophobicity to drive the soil/polymer interaction away from electrostatic and closer to hydrophobic interaction via more hydrophobic non-charged co-monomers with dimethylaminoethyl methacrylate.

C. Acrylic acid-containing terpolymer

It is also respectfully submitted that Claim 17, which recites acrylic acid-containing terpolymers, further distinguishes from the cited reference. The Office action asserts component (C) is optional in the claimed invention. However, this is incorrect for a number of claims, for example Claims 10, 12, 17, 40, 45, 46 and 48. As stated above, Fink et al. expressly teaches acrylic acid moieties are disadvantageous in many cases.

Applicants again note Claim 17 recites the polymer of Claim 7, selected from the group consisting of:

poly(HEA-co-DMAM-co-AA) terpolymer,
poly(HPA-co-DMAM-co-AA) terpolymer, and
poly(PEG-acrylate-co-DMAM-co-AA) terpolymer.

If the elected species is found allowable, it is respectfully submitted a reasonable number of other species, for example, at least those of Claim 17, should also be examined.

V. Conclusion

In view of the current amendments to the claims and the reasons set forth above, it is respectfully submitted that all objections rejections have been overcome. Thus, a Notice of Allowance is respectfully requested.

Please charge any fee deficiency for the processing of this Amendment, or credit any overpayment, to Deposit Account No. 19-4375.

Respectfully submitted,

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